FIG.1

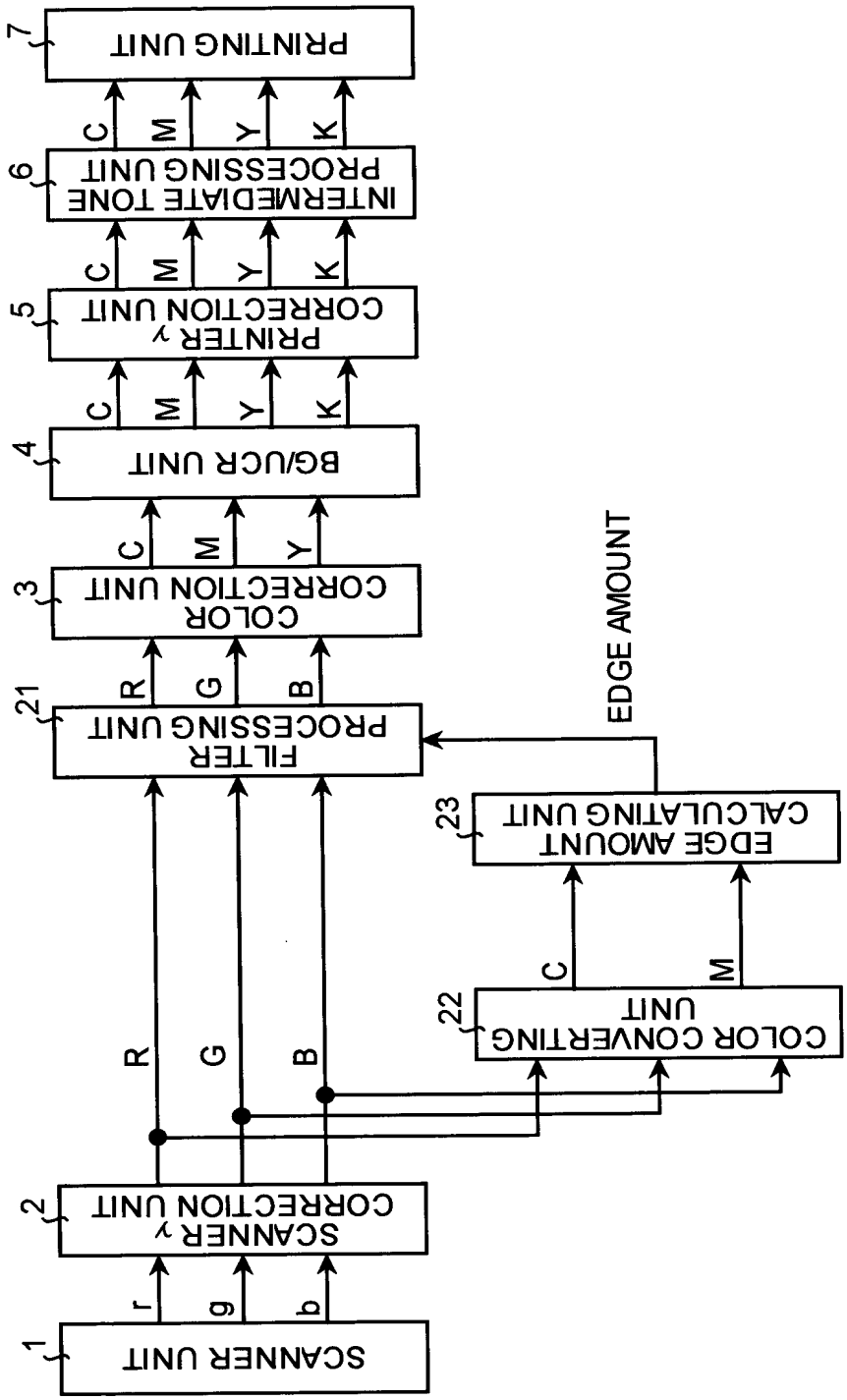

1
SCANNER UNIT
r
g
b
2
SCANNER γ CORRECTION UNIT
R
G
B
21
FILTER PROCESSING UNIT
R
G
B
3
COLOR CORRECTION UNIT
C
M
Y
4
BG/UCR UNIT
C
M
Y
K
5
PRINTER γ CORRECTION UNIT
C
M
Y
K
6
INTERMEDIATE TONE PROCESSING UNIT
C
M
Y
K
7
PRINTING UNIT
EDGE AMOUNT
23
EDGE AMOUNT CALCULATING UNIT
22
COLOR CONVERTING UNIT
C
M

FIG.2

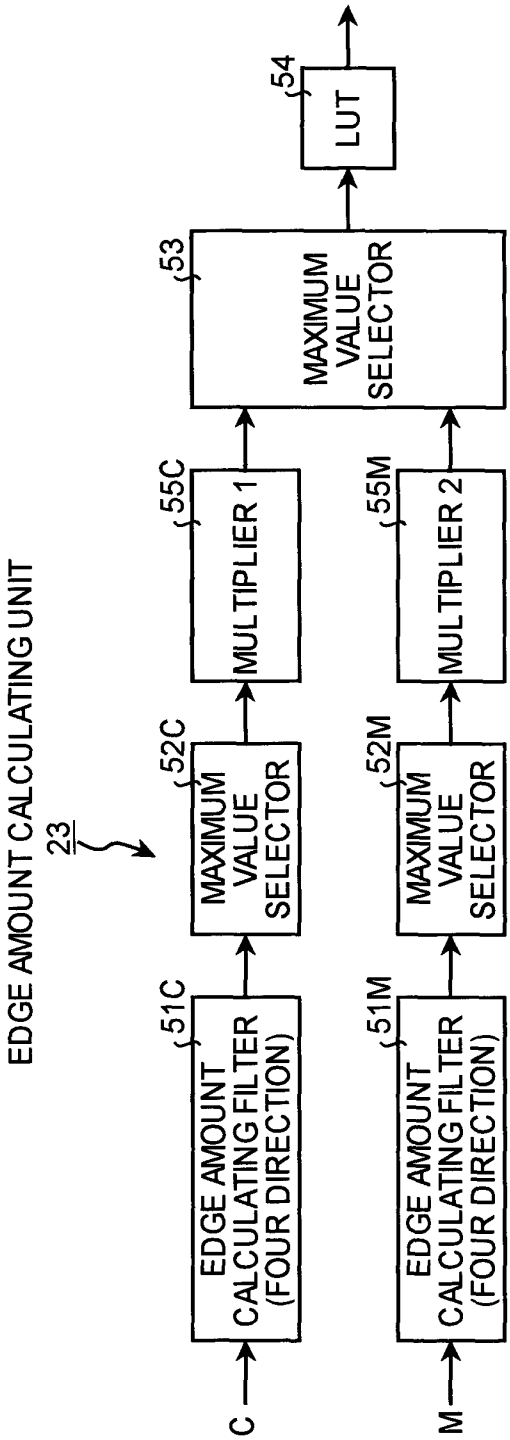

EDGE AMOUNT CALCULATING UNIT
23
C
M
51C
EDGE AMOUNT CALCULATING FILTER (FOUR DIRECTION)
51M
EDGE AMOUNT CALCULATING FILTER (FOUR DIRECTION)
52C
MAXIMUM VALUE SELECTOR
52M
MAXIMUM VALUE SELECTOR
55C
MULTIPLIER 1
55M
MULTIPLIER 2
53
MAXIMUM VALUE SELECTOR
54
LUT

FIG.3A

-1	-1	0	1	1
-1	-1	0	1	1
-1	-1	0	1	1
-1	-1	0	1	1
-1	-1	0	1	1

FIG.3B

-1	-1	-1	-1	-1
-1	-1	-1	-1	-1
0	0	0	0	0
1	1	1	1	1
1	1	1	1	1

FIG.3C

-1	-1	-1	-1	0
-1	-1	-1	0	1
-1	-1	0	1	1
-1	0	1	1	1
0	1	1	1	1

FIG.3D

0	1	1	1	1
-1	0	1	1	1
-1	-1	0	1	1
-1	-1	-1	0	1
-1	-1	-1	-1	0

FIG.4

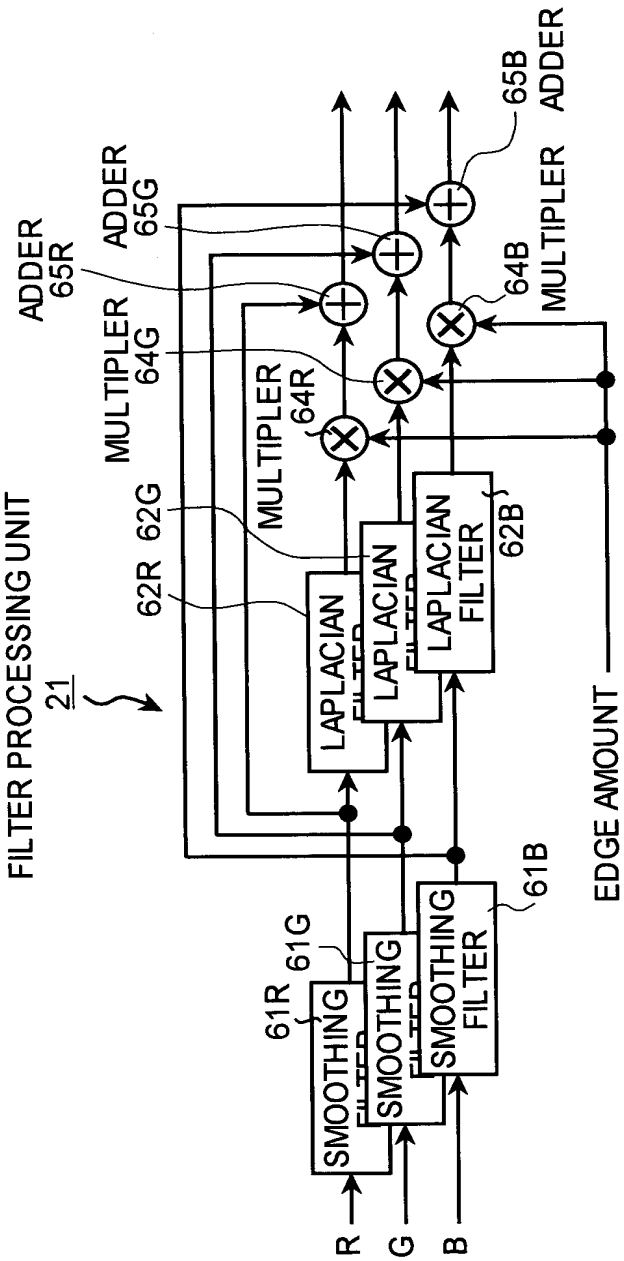

FILTER PROCESSING UNIT
21
R
G
B
SMOOTHING FILTER
61R
61G
61B
LAPLACIAN FILTER
62R
62G
62B
MULTIPLER
64R
64G
64B
ADDER
65R
65G
65B
EDGE AMOUNT

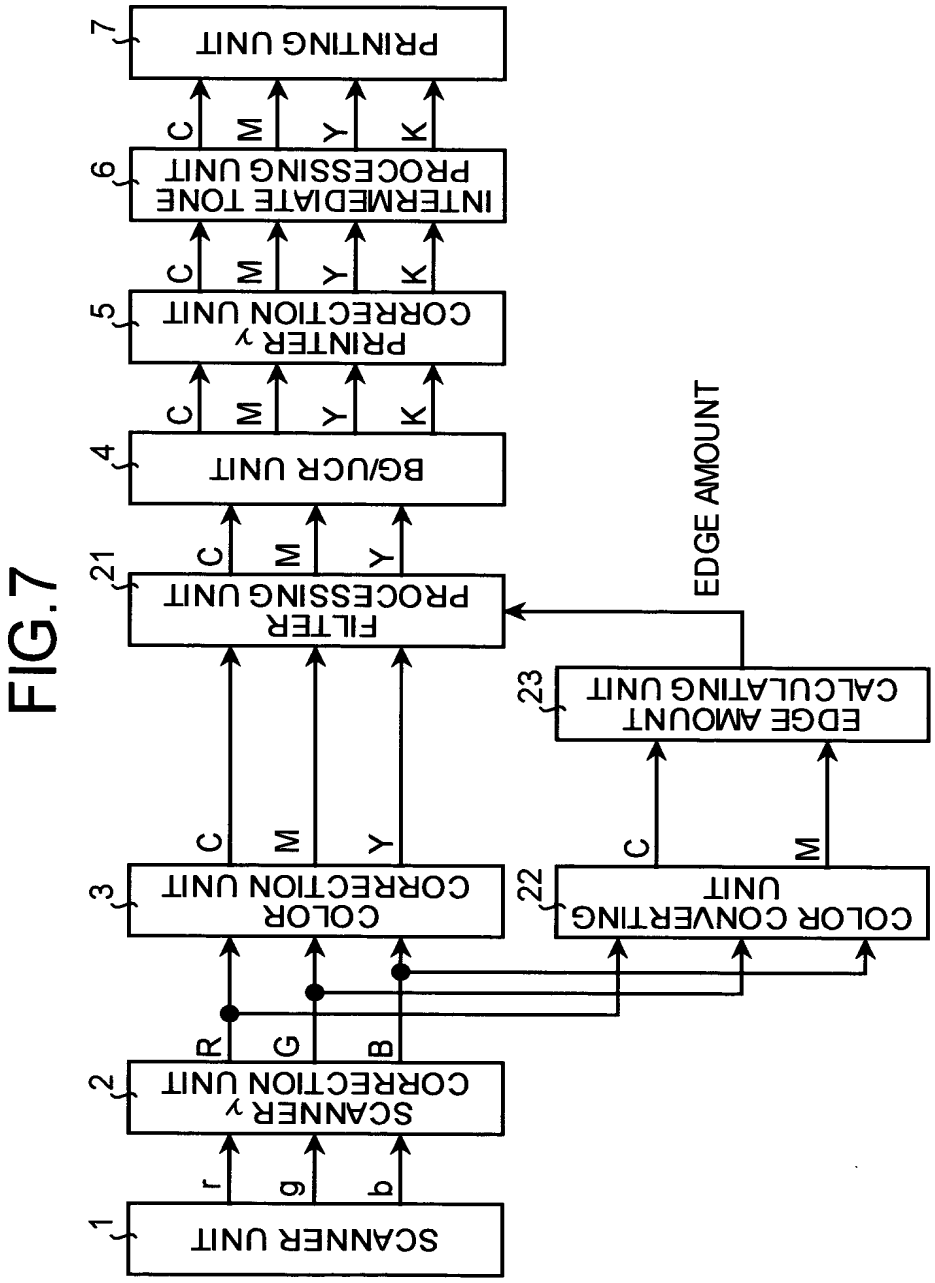
FIG.5

$$1/16 \times \begin{bmatrix} 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 2 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \end{bmatrix}$$

FIG.6

$$1/16 \times \begin{bmatrix} 0 & 0 & -4 & 0 & 0 \\ -1 & -3 & 16 & -3 & -1 \\ 0 & 0 & -4 & 0 & 0 \end{bmatrix}$$

FIG.7


1
SCANNER UNIT
r
g
b
2
SCANNER γ CORRECTION UNIT
R
G
B
3
COLOR CORRECTION UNIT
C
M
Y
21
FILTER PROCESSING UNIT
C
M
Y
4
BG/UCR UNIT
C
M
Y
K
5
PRINTER γ CORRECTION UNIT
C
M
Y
K
6
INTERMEDIATE TONE PROCESSING UNIT
C
M
Y
K
7
PRINTING UNIT
22
COLOR CONVERTING UNIT
C
M
23
EDGE AMOUNT CALCULATING UNIT
EDGE AMOUNT

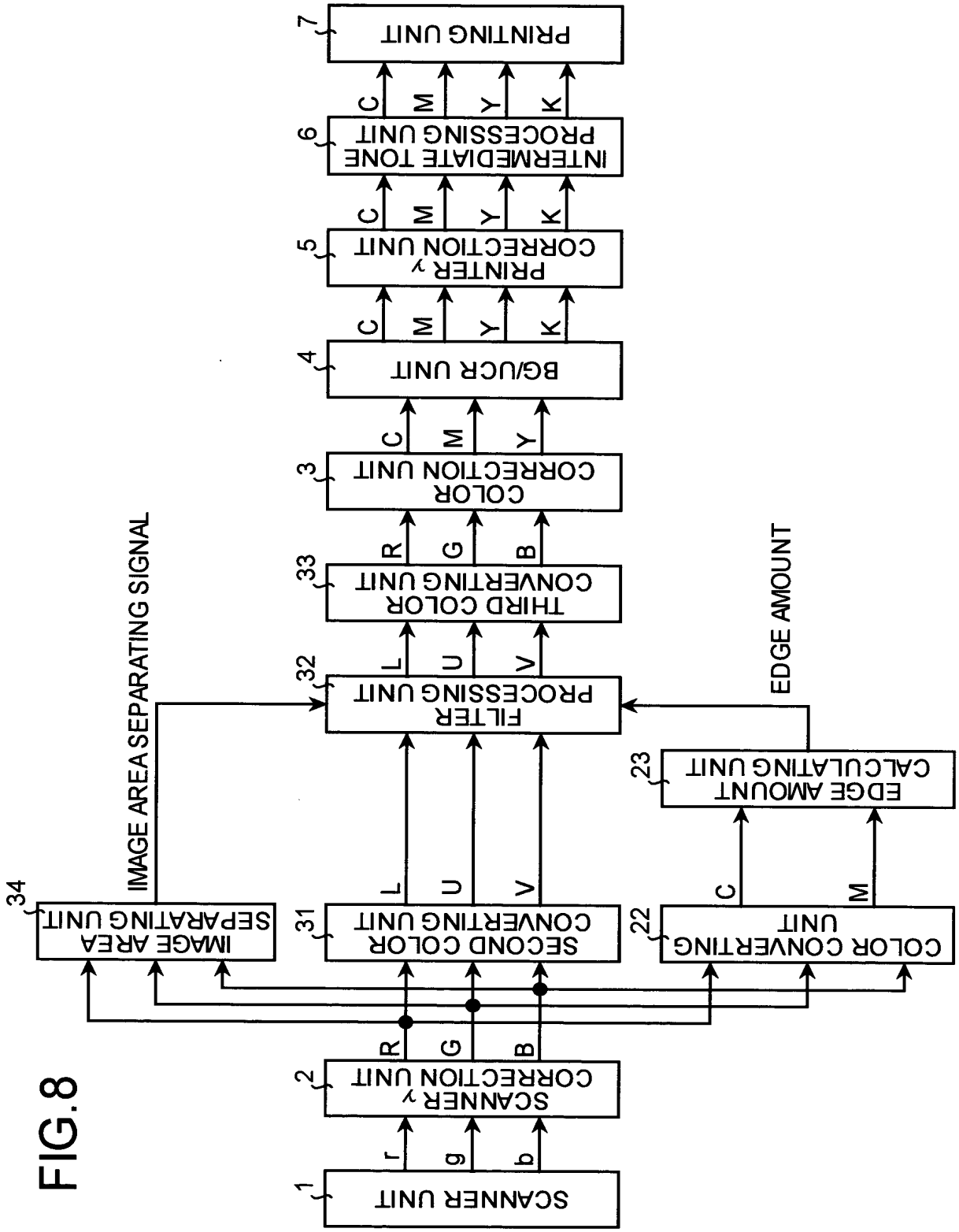

SCANNER UNIT
1
r
g
b
SCANNER γ CORRECTION UNIT
2
R
G
B
IMAGE AREA SEPARATING UNIT
34
SECOND COLOR CONVERTING UNIT
31
L
U
V
COLOR CONVERTING UNIT
22
C
M
EDGE AMOUNT CALCULATING UNIT
23
EDGE AMOUNT
FILTER PROCESSING UNIT
32
L
U
V
THIRD COLOR CONVERTING UNIT
33
R
G
B
COLOR CORRECTION UNIT
3
C
M
Y
BG/UCR UNIT
4
C
M
Y
K
PRINTER γ CORRECTION UNIT
5
C
M
Y
K
INTERMEDIATE TONE PROCESSING UNIT
6
C
M
Y
K
PRINTING UNIT
7

FIG.8

FIG.9

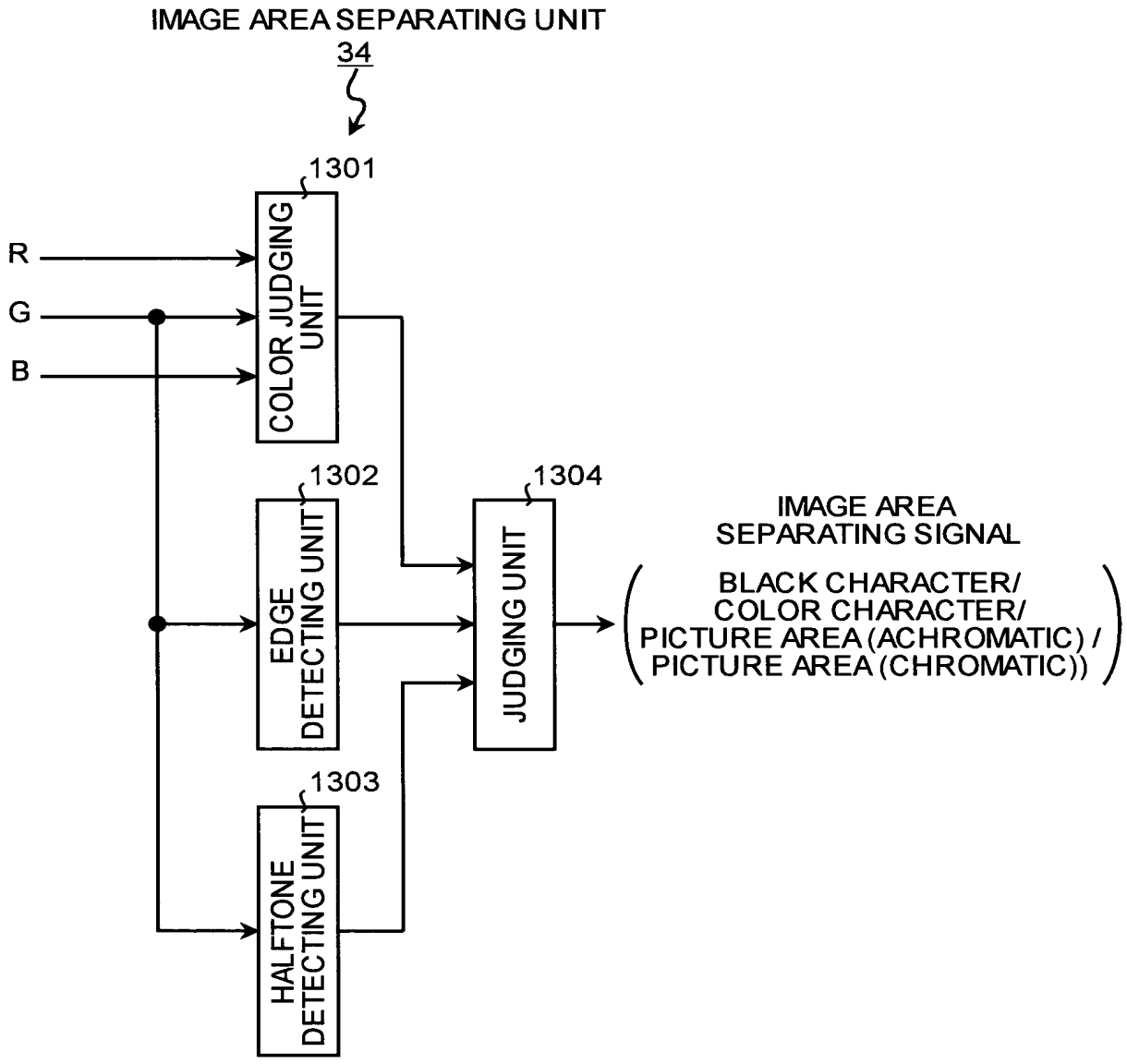


IMAGE AREA SEPARATING UNIT
34
1301
R
G
B
COLOR JUDGING UNIT
1302
EDGE DETECTING UNIT
1303
HALFTONE DETECTING UNIT
1304
JUDGING UNIT
IMAGE AREA SEPARATING SIGNAL
BLACK CHARACTER/
COLOR CHARACTER/
PICTURE AREA (ACHROMATIC) /
PICTURE AREA (CHROMATIC))

FIG.10

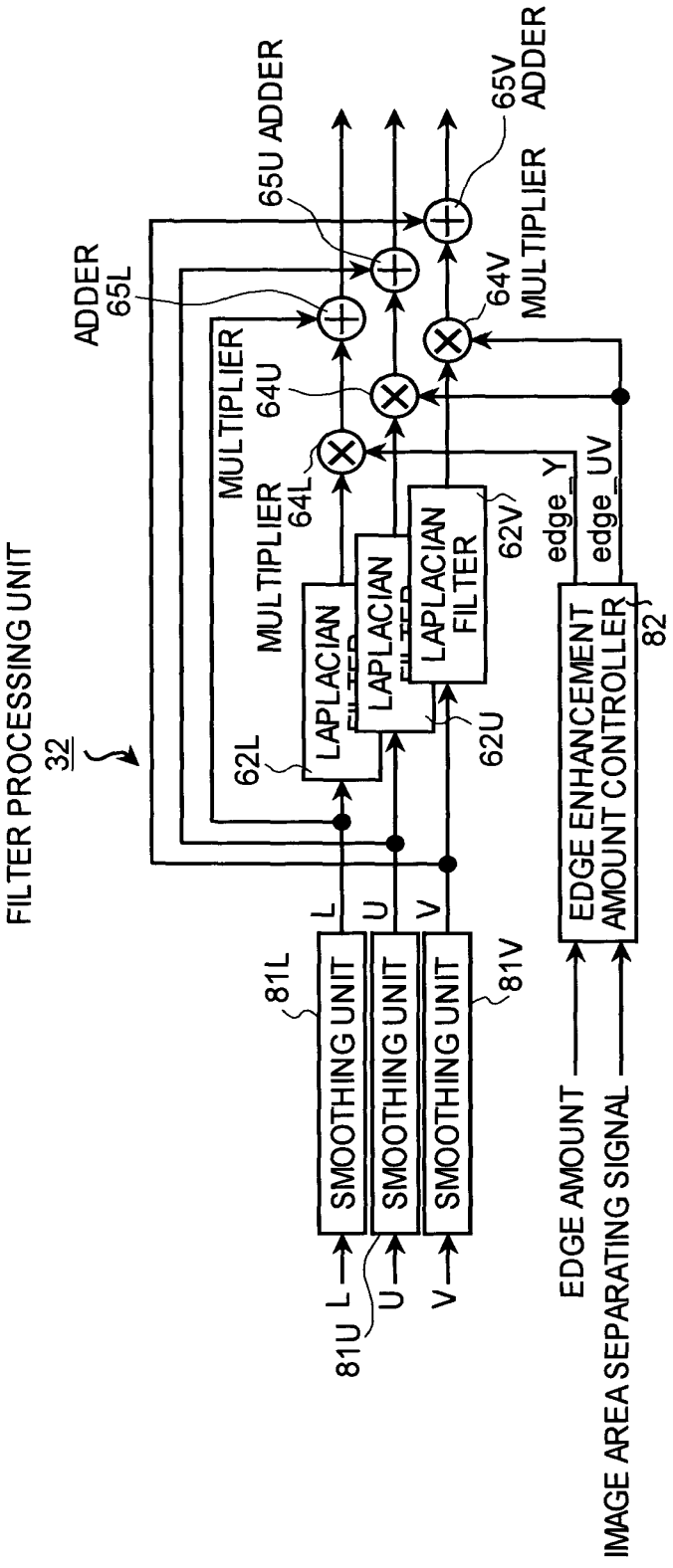
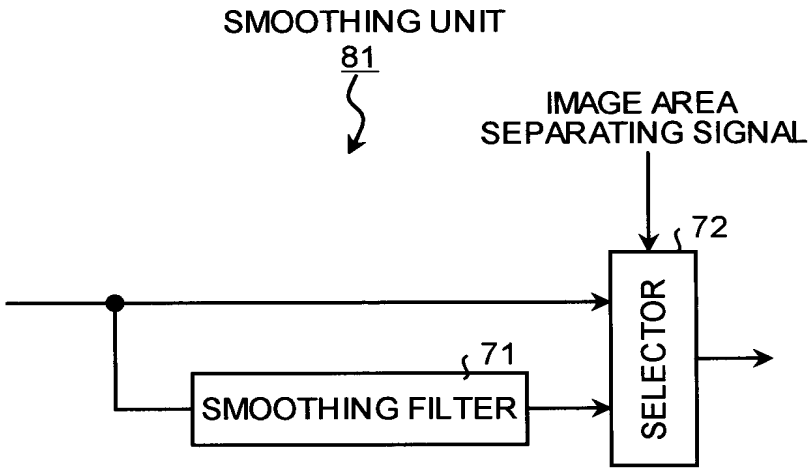

FILTER PROCESSING UNIT
32
81L
81U
81V
SMOOTHING UNIT
SMOOTHING UNIT
SMOOTHING UNIT
L
U
V
62L
62U
62V
LAPLACIAN FILTER
LAPLACIAN FILTER
LAPLACIAN FILTER
MULTIPLIER
64L
MULTIPLIER
64U
64V
MULTIPLIER
ADDER
65L
65U ADDER
65V ADDER
EDGE ENHANCEMENT AMOUNT CONTROLLER
82
edge_Y
edge_UV
EDGE AMOUNT
IMAGE AREA SEPARATING SIGNAL

FIG. 11


SMOOTHING UNIT
81
IMAGE AREA
SEPARATING SIGNAL
72
71
SMOOTHING FILTER
SELECTOR

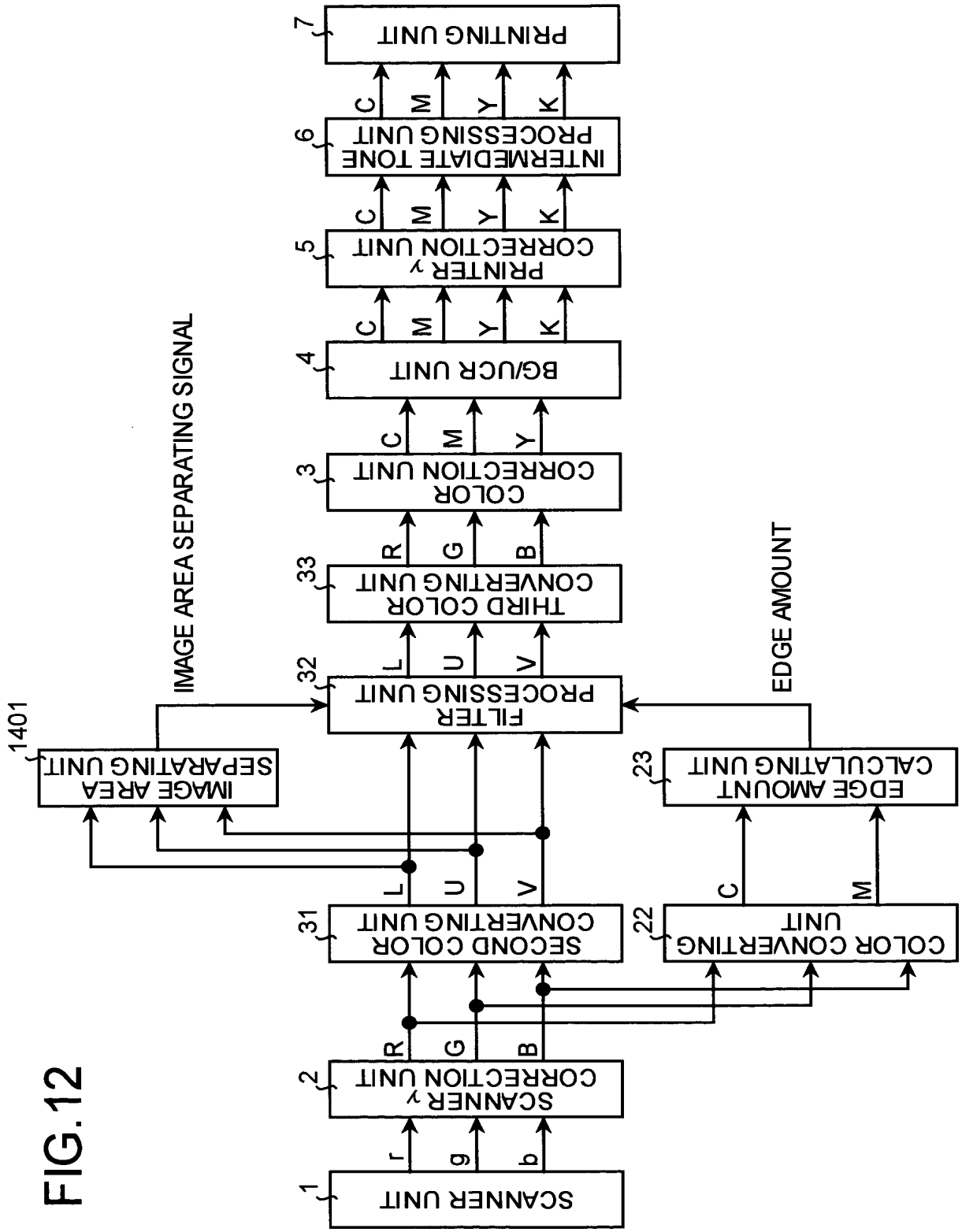

1 SCANNER UNIT
r
g
b
2 SCANNER γ CORRECTION UNIT
R
G
B
31 SECOND COLOR CONVERTING UNIT
L
U
V
22 COLOR CONVERTING UNIT
C
M
23 EDGE AMOUNT CALCULATING UNIT
EDGE AMOUNT
1401 IMAGE AREA SEPARATING UNIT
IMAGE AREA SEPARATING SIGNAL
32 FILTER PROCESSING UNIT
L
U
V
33 THIRD COLOR CONVERTING UNIT
R
G
B
3 COLOR CORRECTION UNIT
C
M
Y
4 BG/UCR UNIT
C
M
Y
K
5 PRINTER γ CORRECTION UNIT
C
M
Y
K
6 INTERMEDIATE TONE PROCESSING UNIT
C
M
Y
K
7 PRINTING UNIT

FIG. 12

FIG. 13

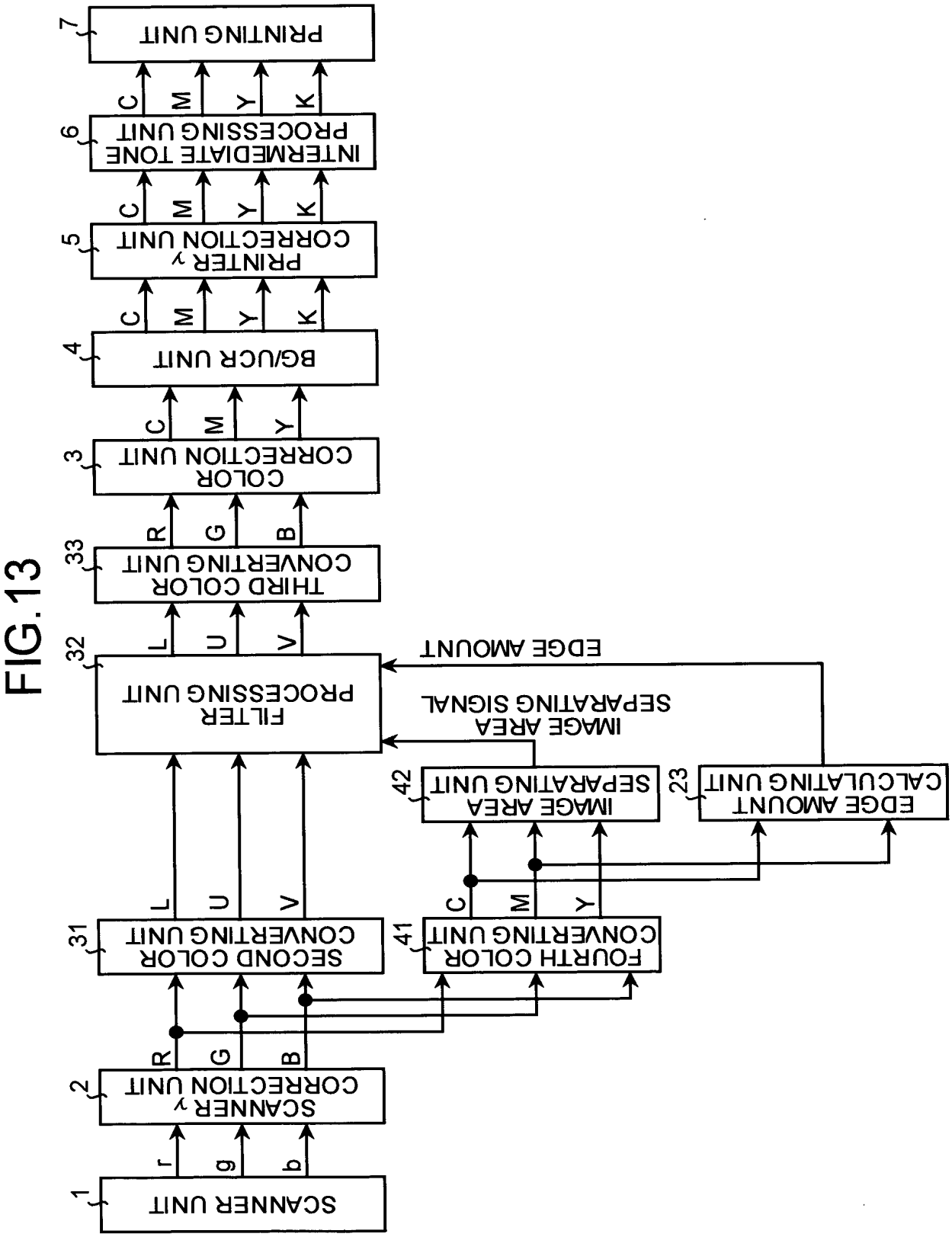

SCANNER UNIT
1
r
g
b
SCANNER γ CORRECTION UNIT
2
R
G
B
SECOND COLOR CONVERTING UNIT
31
L
U
V
FOURTH COLOR CONVERTING UNIT
41
C
M
Y
IMAGE AREA SEPARATING UNIT
42
EDGE AMOUNT CALCULATING UNIT
23
IMAGE AREA SEPARATING SIGNAL
EDGE AMOUNT
FILTER PROCESSING UNIT
32
L
U
V
THIRD COLOR CONVERTING UNIT
33
R
G
B
COLOR CORRECTION UNIT
3
C
M
Y
BG/UCR UNIT
4
C
M
Y
K
PRINTER γ CORRECTION UNIT
5
C
M
Y
K
INTERMEDIATE TONE PROCESSING UNIT
6
C
M
Y
K
PRINTING UNIT
7

FIG. 14

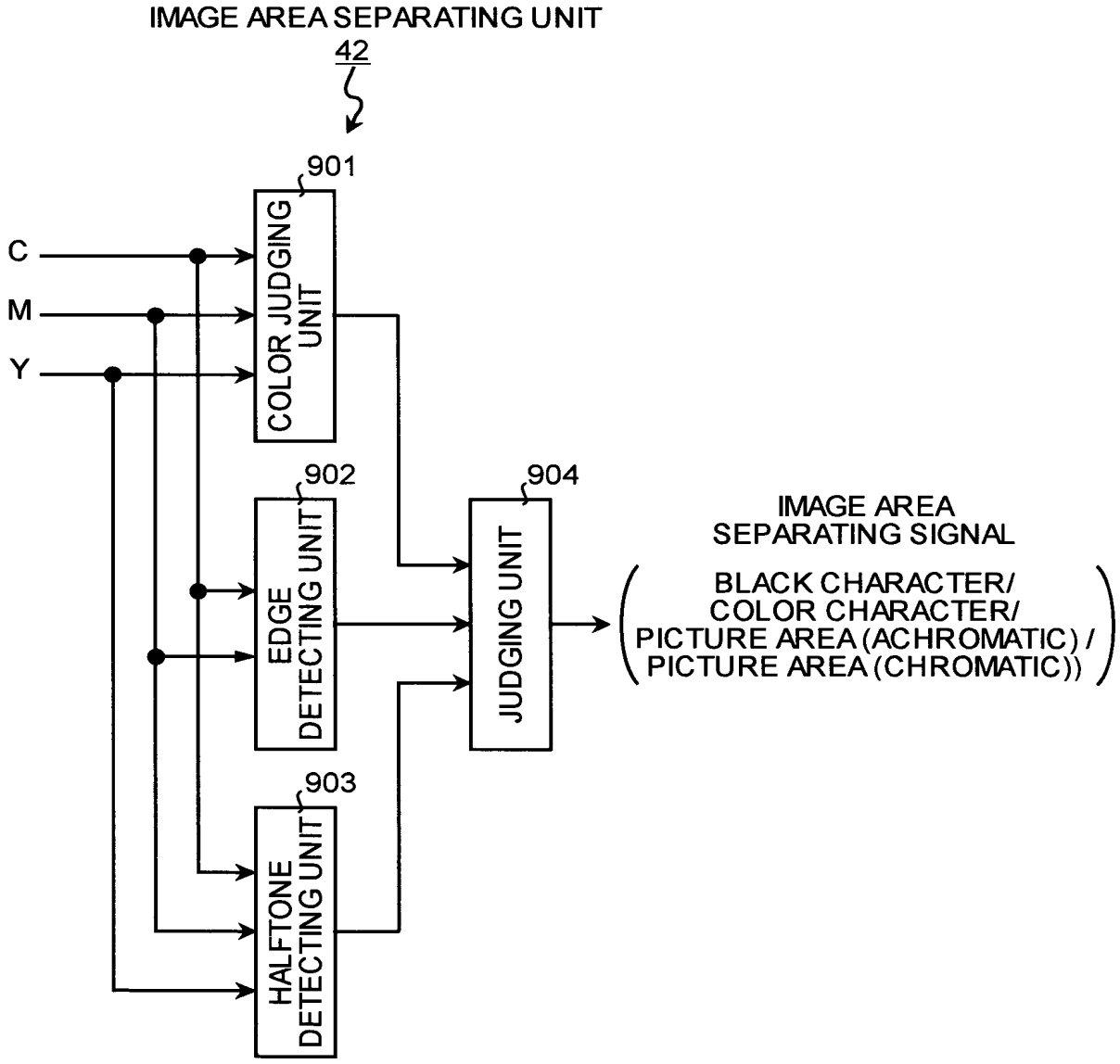
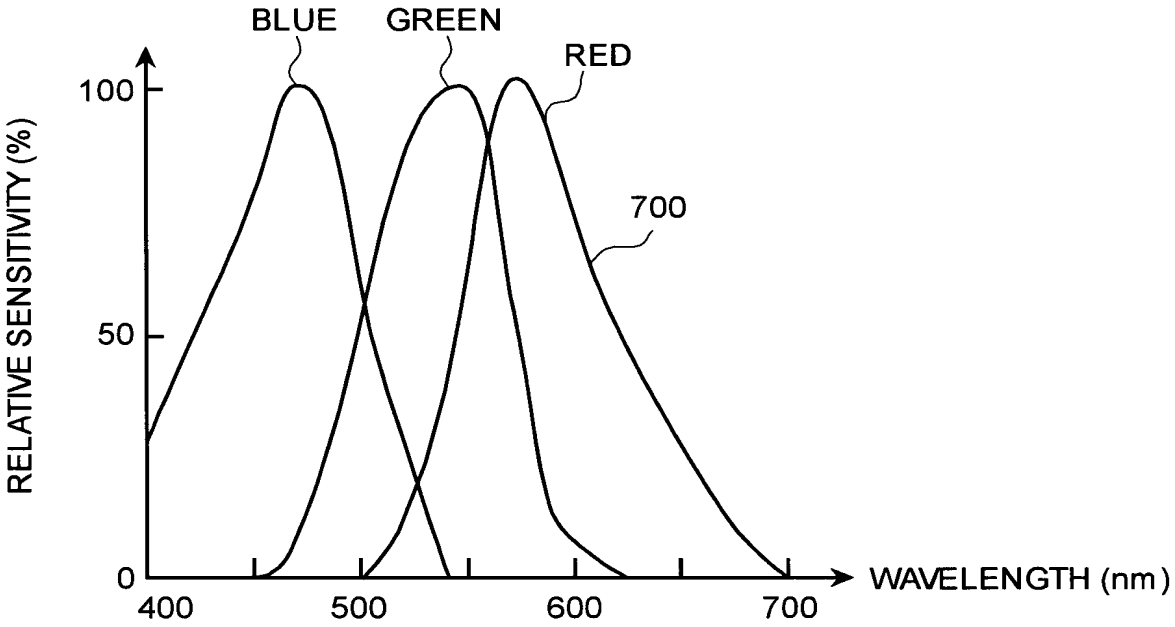


IMAGE AREA SEPARATING UNIT
42
901
C
M
Y
COLOR JUDGING UNIT
902
EDGE DETECTING UNIT
903
HALFTONE DETECTING UNIT
904
JUDGING UNIT
IMAGE AREA SEPARATING SIGNAL
BLACK CHARACTER/
COLOR CHARACTER/
PICTURE AREA (ACHROMATIC) /
PICTURE AREA (CHROMATIC))

FIG.15


BLUE
GREEN
RED
700
100
50
0
RELATIVE SENSITIVITY (%)
400
500
600
700
WAVELENGTH (nm)